TITLE: COMBINED STRUCTURE OF A THERMAL CHAMBER AND A THERMAL TOWER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a combined structure of a thermal chamber and a thermal tower; and especially relates to a heat sinking device of which the base is in the form of a hollow vacuum thermal chamber or vapor chamber, the upper surface of the base is combined with at least a vacuum thermal tower or heat pipe, wherein the inner spaces of the thermal chamber and the thermal tower are communicated with each other. The structure suits a CPU of a computer, a projector, an LCD color monitor, a TV set and other heat generating electronic products.

2. Description of the Prior Art

The art of computer information and techniques of the manufacturers of it have been developed very fast and updated from day to day, the assemblies in a CPU derived from them have had more and more circuits, thus energy consumption has been continuously increased, and problems of heat sinking can not help being mentioned again in order that heat accumulation by high speed operation of a CPU in a computer that induces raising of temperature and damage of the CPU can be avoided. In conventional CPU heat-sinking devices, it is often seen that a fan driven by electric power scatters heat absorbed by a heat-sinking body from an heat source object into a sealed housing of a mainframe in order to get a goal of forced convection; however, this has

the defects of substantial electric power consumption, large volume, large noise, slow speed of heat sinking as well as vibration. And, at present time, there is a use of a thermal tower having no air pressure, wherein the thermal tower set with working fluid to efficiently increase the speed of heat sinking.

A conventional heat-sinking device also has the chance of using a vacuum thermal tower, as the one shown in Fig. 1, a conventional upright thermal tower 10 has a bottom 11 thereof welded to a heat-sinking bottom plate 12 to indirectly increase the contact area of the thermal tower with a heat generating source to increase the effect of heat sinking, however, the speed of heat sinking of it still is limited.

In view of these defects to be gotten rid of and to increase the efficiency of heat sinking, the present invention is developed.

SUMMARY OF THE INVENTION

The primary object of the present invention is to provide a combined structure of a thermal chamber and a thermal tower, by mutual connecting of the thermal chamber and the thermal tower, the efficiency of heat sinking can be increased.

To achieve the above stated object, the combined structure of a thermal chamber and a thermal tower of the present invention comprises: a hollow vacuum thermal chamber forming a base, of which the upper surface is provided at least with an opening; and at least a vacuum thermal tower combined with the opening of the vacuum thermal chamber, the inner spaces of the thermal chamber and the thermal tower are communicated with each other. And the thermal tower can be added

therearound with heat-sinking fins.

Thereby, heat generating electronic products such as a CPU of a computer, a projector, an LCD color monitor, a TV set etc. can get excellent heat-sinking effects by heat conducting by means of the vacuum thermal chamber and the vacuum thermal tower.

The present invention will be apparent after reading the detailed description of the preferred embodiments thereof in reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded perspective view showing the appearance of a conventional upright hollow thermal tower connected on the bottom thereof a bottom plate;

Fig. 2 is an exploded perspective view showing the appearance of a first embodiment of the combined structure of a vacuum thermal chamber and a vacuum thermal tower of the present invention;

Fig. 3 is an exploded perspective view showing the appearance of a second embodiment of the combined structure of a vacuum thermal chamber and a vacuum thermal tower of the present invention;

Fig. 4 is an analytic perspective view showing the combined structure of the second embodiment of the combined structure of a vacuum thermal chamber and a vacuum thermal column of the present invention;

Fig. 5 is a perspective view showing the appearance of a third embodiment of the combined structure of a vacuum thermal chamber and two vacuum thermal towers or columns of the present invention;

Fig. 5A is a sectional view showing the third embodiment of the combined structure of a vacuum thermal chamber and two vacuum thermal towers or columns of the present invention;

Fig. 6 is a perspective view showing the appearance of a fourth embodiment of the combined structure of a vacuum thermal chamber and an inversed "U" shaped vacuum thermal tower or column of the present invention;

Fig. 6A is a sectional view showing the fourth embodiment of the combined structure of a vacuum thermal chamber and an inversed "U" shaped vacuum thermal tower or column of the present invention;

Fig. 7 is a perspective view showing the appearance of a fifth embodiment of the combined structure of a vacuum thermal chamber and four hollow heat pipes of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is characterized in using the combined structure of a vacuum thermal chamber and at least a vacuum thermal tower or column to increase heat conductive heat-sinking effect, and to avoid damage or inferior function of products by overly large accumulating heat from heat generating sources.

Referring to Fig. 2 showing a first embodiment of the combined structure of a vacuum thermal chamber and a vacuum thermal tower of the present invention, the structure comprises an upright hollow vacuum thermal tower or thermal column 20 and a vacuum thermal chamber or vapor chamber 22 forming a base, the vacuum thermal chamber or vapor chamber 22 has on the upper surface thereof an opening 23.

The hollow vacuum thermal tower or thermal column 20 has on the upper end thereof a vacuum sealed-opening 21, and has the other end thereof the opened opening which is combined to the opening 23 to make the interior spaces communicated with each other.

Thereby as shown in Fig. 2, by drawing air to make a vacuum from the upper end of the vacuum sealed-opening 21, the bottom of a flat vacuum thermal chamber or vapor chamber 22 can be connected with a CPU of a computer, a projector, an LCD color monitor, a TV set and other heat generating electronic products; and heat can be fast scattered through the flat vacuum thermal chamber or vapor chamber 22 and the cylindrical vacuum thermal tower or thermal column 20.

Referring Figs. 3 and 4 showing a second embodiment of the present invention, the structure comprises an upright hollow cylindrical vacuum thermal column 20, a flat vacuum thermal chamber or vapor chamber 22 and a plurality of heat sinking fins 26.

The upright hollow cylindrical vacuum thermal tower or thermal column 20 is combined at the periphery thereof with a plurality of heat sinking fins 26 parallel to the flat vacuum thermal chamber or vapor chamber 22 to increase the area and the effect of heat scattering.

Referring Figs. 5 and 5A showing a third embodiment of the present invention, the structure comprises: a hollow vacuum thermal chamber or vapor chamber 22 forming a base, the vacuum thermal chamber or vapor chamber 22 has on the upper surface thereof two openings 23; two cylindrical vacuum thermal towers or thermal columns 28, 30 respectively combined with the two openings 23, the interior

space thereof is communicated with the interior space of the hollow vacuum thermal chamber or vapor chamber 22; and a plurality of heat sinking fins 26 combined with the peripheries of the two cylindrical vacuum thermal tower or thermal column 28, 30, and parallel to the vacuum thermal chamber or vapor chamber 22. When in practicing, the vacuum sealed-opening 21 can be provided on the upper end of either of the two cylindrical vacuum thermal tower or thermal column 28, 30, or can be provided on a side of the vacuum thermal chamber or vapor chamber 22.

Referring Figs. 6 and 6A showing a fourth embodiment of the present invention, the structure comprises: an inversed "U" shaped vacuum thermal column 29, a plurality of heat sinking fins 26 and a vacuum thermal chamber or vapor chamber 22; the inversed "U" shaped vacuum thermal column 29 is formed by bending of a straight vacuum thermal column. In the present embodiment of the present invention, a vacuum sealed-opening 25 is provided on one side of the vacuum thermal chamber or vapor chamber 22.

Referring to Fig. 7 showing a fifth embodiment of the present invention, the structure comprises: a vacuum thermal chamber or vapor chamber 22 forming a base, it has at the four corners on the upper surface thereof four openings; four hollow heat pipes all with a smaller diameter are combined respectively with the four openings of the vacuum thermal chamber or vapor chamber 22, the interior space thereof are communicated with the interior space of the vacuum thermal chamber or vapor chamber 22; a plurality of heat sinking fins 27

combined with the peripheries of the four hollow heat pipes, the heat sinking fins 27 are parallel to the base or the vacuum thermal chamber or vapor chamber 22, an opening 271 is formed centrally of the heat sinking fins 27 to get all the way through from the top to the bottom of them and to increase the effect of heat sinking.

Therefore, by drawing air to make a vacuum, the flat vacuum thermal chamber or vapor chamber 22 in the form of the base can be combined on the bottom thereof with a heat generating electronic device; heat can be effectively scattered through the combined structure stated above, and thereby the life of use of the electronic device can be elongated.

The present invention thereby has the following advantages:

1. After drawing air to make a vacuum of a conventional upright thermal tower, a plate is welded to the bottom of the thermal tower to increase the contact area of the thermal tower with a heat generating body to increase the effect of heat sinking; however, the speed of heat sinking of it is far smaller than that of the combined structure of a vacuum thermal chamber and a vacuum thermal tower of the present invention having the interior spaces of them mutually communicated, thereby, the present invention has higher efficiency of heat sinking.
2. The interior spaces of the vacuum thermal chamber and the vacuum thermal tower of the present invention are mutually communicated, so that the vacuum sealed-opening of the present invention can be provided on the upper end of the vacuum thermal tower, or on a side

of the vacuum thermal chamber, thus the present invention is more convenient in operation.

In conclusion, the present invention can surely get its expected object to provide a vacuum heat-sinking device. The embodiments given are only for illustrating the present invention, and not for giving any limitation to the scope of the present invention. It will be apparent to those skilled in this art that various modifications or changes without departing from the spirit of this invention shall also fall within the scope of the appended claims. Having now particularly described and ascertained the nature of the present invention having its industrial value, we declare that what we claim are: